CLAIMS

1. A method of compressing values of a waveform of a monitored electrical power signal, comprising:

acquiring data representing periods of the waveform;

decomposing the waveform of the power signal into a plurality of components, over a plurality of periods of the waveform; and

compressing the values of at least some of the components over a plurality of periods, separately.

2. A method according to claim 1, wherein decomposing the waveform of the power signal into components comprises decomposing the waveform of the power signal into frequency components.

3. A method according to claim 1, wherein compressing the values of at least some of the components comprises fitting time segments of the components into a model and recording coefficients of the fitting.

4. A method according to claim 3, wherein the model comprises a constant function over time.

5. A method according to claim 4, wherein the recorded coefficients for the constant function over time comprise a single value and a length.

6. A method according to claim 3, wherein the model comprises a monotonous function over time.

7. A method according to claim 1, wherein acquiring data representing periods of the waveform comprises acquiring samples of the power signal and dividing the samples into groups corresponding to cycles of the power signal.

8. A method according to claim 7, wherein decomposing the waveform comprises transforming the samples of each group, into harmonic component values.

9. A method according to claim 8, wherein compressing at least some of the components separately comprises storing for each harmonic, pairs of an average value and a number of cycles in which the value is close to the average value.

10. A method according to claim 9, wherein the number of cycles in which the value is close to the average value is determined by determining a minimum and maximum of a train of harmonic values and determining when the distance between the minimum and maximum is greater than a predetermined distance.

11. A method according to claim 10, wherein the predetermined distance is a configured percentage of the average recent value of the harmonic.

12. A method according to claim 10, wherein the predetermined distance is a configured percentage of a configured expected value of the harmonic.

13. A method according to claim 7, wherein acquiring the samples comprises acquiring an analog signal and sampling the signals.

14. A method according to any of claims 7-13, wherein dividing the samples into groups comprises repetitively determining a main power frequency of the signal and accordingly determining cycles of the power signal.

15. A method according to claim 14, wherein sampling the signals comprises sampling at a rate determined responsive to the main power frequency.

16. A method according to claim 14, wherein repetitively determining the main power frequency comprises determining from the acquired samples.

17. A method according to claim 14, wherein repetitively determining the main power frequency comprises determining from an analog signal from which the acquired samples are generated.

18. A method according to claim 8, wherein transforming the samples of each group comprises transforming using a fast Fourier transform.

19. A method according to claim 8, comprising applying a lossless compression method to the compressed harmonic values.

20. A method according to claim 1, comprising storing at least some of the compressed components in a file structure representing a plurality of power signals.

21. A method according to claim 1, comprising storing the compressed components in a file structure representing the power signal continuously over more than a month.

22. A method according to claim 1, comprising transmitting the compressed components over a communication link.

23. A method according to claim 1, wherein compressing at least some of the components comprises compressing each of the components separately.

24. A method according to claim 1, wherein compressing at least some of the components comprises compressing in real time.

25. A method according to claim 1, wherein compressing at least some of the components comprises compressing using a lossy compression.

26. A method according to claim 1, wherein compressing at least some of the components separately comprises compressing separately over at least three periods of the waveform.

27. A method according to claim 1, wherein the power signal comprises a current signal.

28. A method according to claim 1, wherein the power signal comprises a voltage signal.

29. A method according to claim 1, wherein acquiring data representing periods of the waveforms comprises acquiring data representing cycles of the waveform.

30. A method according to claim 1, wherein acquiring data representing periods of the waveforms comprises acquiring data representing periods shorter or longer than the cycles of the waveform.

31. A method according to claim 1, wherein decomposing the waveform into a plurality of components comprises decomposing into components which co-extend in time.

32. A method of compressing values of a monitored electrical power signal, comprising:
acquiring samples of the power signal;
dividing the samples into groups corresponding to cycles of the power signal;
transforming the samples of each group, into harmonic component values; and
storing a representation of the harmonic component values on a non-volatile storage medium, continuously over at least a week.

33. A method according to claim 32, wherein storing the representation comprises storing a compressed representation of the harmonic component values.

34. A method according to claim 33, wherein storing the compressed representation comprises storing a compression based on compressing together values of each harmonic component over a plurality of cycles.

35. A device for monitoring electrical power signals, comprising:
a power line interface for measuring power line signals;
a non-volatile storage medium; and
a processor adapted to store a representation of waveform information of measured power line signals on the storage medium continuously, regardless of whether a special event was identified.

36. A device according to claim 35, wherein the power line signals comprise at least one current signal.

37. A device according to claim 35, wherein the power line signals comprise at least one voltage signal.

38. A device according to claim 35, wherein the processor is adapted to store the representation continuously over at least a week.

39. A device according to claim 35, wherein the device is not adapted to identify special events.

40. A device according to claim 35, wherein the storage medium has a capacity smaller than 1 Gbyte.

41. A device according to claim 35, wherein the storage medium has a capacity greater than 1 Gbyte.

42. A device according to claim 35, wherein the processor is adapted to compress the measured power signals with at least a predetermined minimal compression ratio.

43. A device according to claim 42, wherein the processor is adapted to adjust the loss level of the compression in order to achieve the predetermined minimal compression ratio.

44. A device according to claim 35, wherein the processor is adapted to compress the measured power signals in real time.

45. A device according to claim 35, wherein the processor is adapted to compress the measured power signals with a lossy compression method.

46. A device according to claim 35, wherein the interface is adapted to provide samples of the power signals at a rate of at least 8 samples per cycle of the power signals.

47. A method of compressing values of a monitored electrical power signal, comprising:
acquiring samples of the power signal; and
compressing the samples of the power signal using a lossy compression method.

48. A method according to claim 47, wherein compressing the samples comprises compressing in real time.

49. A device according to claim 47, wherein acquiring the samples comprises acquiring at a rate of at least 50 samples per cycle of the power signal.